

Questions and Answers
Virtual Ethylene Oxide Community Meeting in Westlake, Louisiana near the
Sasol Chemical Facility
September 30, 2021

Questions and answers are grouped by the topics stakeholders asked about

EtO ALTERNATIVES

Q: Is there anything else that can be used in lieu of ethylene oxide?

A: EPA provided a verbal response during the meeting to state that EtO cannot be replaced in all instances. We offer the following additional information:

There are two key uses for ethylene oxide (EtO):

- 1) It is used to make other chemicals that produce many everyday products.
- 2) It is used to sterilize devices that can't be sterilized using steam or heat, such as some medical and dental equipment.

Ethylene oxide is reacted to make ethylene glycol, which is a key ingredient in a variety of consumer household products. Ethylene oxide is an essential building block for synthetic fibers (e.g., upholstery, carpet), plastics, PVC pipe and cosmetics. EtO is necessary to assure that some types of medical equipment are sterilized for safe use. EtO is used for items that are sensitive to moisture, heat, or radiation. It can penetrate various materials and safely sterilize the equipment without causing damage.

EMISSIONS DATA

Q: What proof, if any, has Sasol provided to EPA to support its ethylene oxide recalculations?

A: EPA provided a verbal response during the meeting. We offer the following additional information:

Emissions information is provided to EPA by the States through their emissions inventory and directly by facilities through the Toxic Release Inventory program. Both of these programs have quality assurance and control procedures for the emissions data they receive and post online for public access.

REGULATORY AGENCY INFORMATION/AUTHORITY/ACTIONS

Q: If Sasol is following its permits and, in Sasol's case, emitting well below what they are allowed to, then what are you telling us as the local community?

A: It is possible for a facility to be in compliance with all applicable regulations and permits and still be causing or contributing to air toxics risks of concern.

Ethylene oxide is one of 187 pollutants that Congress classified as "hazardous air pollutants," also called "air toxics." The Clean Air Act instructs the U.S. EPA to regulate air toxics by setting limits on the amount of pollution that industrial sources can *emit* to the air, rather than by setting *ambient standards*, which are limits on the amount of a pollutant that is allowed in the outdoor air. So, the Agency does not have a "bright line," or a level for ethylene oxide in the community below which air quality is considered OK.

Outside of EPA's current regulatory requirements, EPA generally is encouraging facilities that emit EtO to reduce EtO emissions voluntarily. EPA acknowledges that companies and facilities are the most knowledgeable about their specific facility processes and plans. EPA Region 6 has been, and will continue to be, open to communication with State agencies and companies about reducing EtO emissions.

EPA is taking a closer look at regulations to address ethylene oxide emissions. The agency anticipates issuing a proposed rule for commercial sterilizers in Spring 2022. In addition, the agency is beginning work to review other regulations for facilities that emit ethylene oxide. These include complex rulemakings, which can take about three years to complete. The following rules are under review, with their anticipated final date:

- Group 1 Polymers and Resins (Neoprene): 2024
- Synthetic Organic Chemicals Manufacturing Industry: 2024
- Polyether Polyols Production: 2024
- Chemical Manufacturing Area Sources: 2024

Q: Can EPA use its information collection authority (under section 114 of the Clean Air Act) to require fenceline monitoring at Sasol, as it did for the Denka facility in LaPlace?
(*Fence line monitoring response*)

A: EPA provided a verbal response during the meeting. We offer the following additional information:

The fenceline air monitoring method cannot currently monitor for ethylene oxide sufficiently. Research is underway to improve EPA's air monitoring methods to determine if there is an appropriate approach to measure ethylene oxide at the fenceline and certainly will evaluate whether a fenceline method can be considered in future rulemaking for facilities with ethylene oxide emissions.

Q: Is there any possibility that you can consider an interim rule that will take care of the emergency situations that are taking place at Mossville as well as trying to give some consideration to having industry recognize what's already in the background?

A: EPA is revisiting air toxics rules for a number of source categories that emit ethylene oxide and as part of that review we will consider whether those requirements need to be strengthened.

The Clean Air Act instructs EPA to regulate air toxics by setting limits on the amount of pollution that industrial sources can *emit* to the air, rather than by setting *ambient standards*, which are limits on the amount of a pollutant that is allowed in the outdoor air. So, the Agency does not have a specific EPA requirement that companies address background EtO levels that may be in the air around their facilities.

PAST/FUTURE EVALUATIONS/ASSESSMENTS

Q: Why is EPA answering questions about ethylene oxide now and not back in 1994 when citizens complained about the ethylene oxide?

A: EPA provided a verbal response during the meeting. We offer the following additional information:

EPA is addressing ethylene oxide based on the results of the latest National Air Toxics Assessment (NATA) which identified the chemical as a potential concern in several areas across the country. The NATA elevated risk estimates are largely driven by an EPA risk value that was updated in late 2016. Before the 2016 change in the ethylene oxide risk

value, EPA's data did not indicate ethylene oxide might be significantly contributing to possible human health risks of concern in certain areas.

Q: Why would you not examine every chemical used by industry to make sure it was safe?

A: EPA provided a verbal response during the meeting. We offer the following additional information:

The 2014 NATA estimates ambient and exposure concentrations for 180 air toxics plus diesel particulate matter (PM), which we assess for noncancer effects only. Using the concentration estimates for the 180 air toxics plus diesel PM, NATA estimates cancer risks and noncancer hazards for 138 air toxics.

For the risk assessments of ethylene oxide emitting facilities in Texas and Louisiana, facility-specific available emissions data for hazardous air pollutants was based on the most recent and publicly available 2018 National Emissions Inventory

EPA's plans for future national risk evaluations of facility air toxics emission data can be found on the following webpages:

- [HYPERLINK "<https://www.epa.gov/newsreleases/epa-improve-access-transparency-and-timeliness-air-toxics-data-and-risk-information>"]
- [HYPERLINK "<https://www.epa.gov/haps/improving-access-air-toxics-data>"]
- [HYPERLINK "<https://www.epa.gov/system/files/documents/2021-08/air-toxics-data-update-overview-final.pdf>"]

ENFORCEMENT/PERMITTING

Q: What fines have been levied against Sasol to economically incentivize hiring workers and spending money to control emissions?

A: There are no EPA or LDEQ air quality regulations that require facilities to economically incentivize hiring workers. Fines can only be applied through enforcement actions where EPA or LDEQ deem they are required or appropriate. Emission controls can also be implemented voluntarily or by new applicable rule or permit requirements, if appropriate.

Q: If emissions lowered to safe levels, how many jobs at Sasol could be created?

A: Development of new EPA air toxics regulations or revisions to existing air toxics regulations typically address the economic impacts of the rule or rule revision but may not specifically address job creation.

Q: Will Sasol modify its air permit to lower its permitted ethylene oxide emissions, to prove its commitment to protecting the health of the community?

A: Currently, there are no EPA requirements to require Sasol to lower its permit limits for EtO emissions. Currently, most States and EPA do not require the permit limits for EtO emissions to be revised or lowered.

Commented [VF1]: Sent to Sasol. EPA verbally committed to also ask Sasol.

Commented [VF2]: Sent to Sasol. Will Sasol voluntarily lower its permit limits for EtO?

RISK ASSESSMENT

Q: Page 16 of the risk assessment report says that eight people in the area have cancer risks of 300 in a million. How did you define that group?

A: It is important to note that when EPA put the National Air Toxics Assessment together and when we updated the risk assessment based on 2018 emissions for the community around Sasol, those assessments were based on predictive models of air toxics emissions and what the estimated potential human health risks from inhaling them may be. The results are not reports of actual cancers occurring in the area being assessed nor do the results indicate where actual cancer cases could occur in the future.

Typically, but not in all cases, air toxics emissions impacts predicted by air dispersion and risk modeling outside the fence line generally decrease with more distance from the emission source. The predicted risks from air toxics near Sasol are higher for residents who live closest to the facility.

Q: Has the EPA compared EtO levels and risk in urban areas with no industrial areas for increased cancer?

A: EPA is addressing ethylene oxide based on the results of the latest National Air Toxics Assessment (NATA), which identified the chemical as a potential concern in several areas across the country. NATA is the Agency's nationwide air toxics screening tool, designed to help EPA and state, local and tribal air agencies identify areas, pollutants or types of sources for further examination.

EPA has been looking at what we consider background concentrations of ethylene oxide and are evaluating the results from those monitors across the nation in urban and rural areas that are not associated with a particular industry. EPA is also working on understanding other sources of ethylene oxide emissions that may influence the results from those monitors.

A summary of EPA's *Work to Understand Background Levels of Ethylene Oxide* can be found at:

[HYPERLINK "https://www.epa.gov/sites/default/files/2020-09/documents/background_eto_monitoring.september_2020.pdf" \t "_blank"]

Q: What would the cancer risk be if they actually emitted what they are permitted to emit?

A: It is not uncommon for actual emissions to be significantly lower than permitted or allowable emissions established in a major new source review (NSR) permits or minor NSR permit. Most permit guidance issued by primary permitting authorities allows applicants to determine the source's potential to emit by using the maximum operating conditions that the source will be permitted to use under federally enforceable requirements considering the efficiency of the air pollution control system, if any, that will be used or contemplated for the maximum case operating conditions, where the use of such equipment will be federally-enforceable. Also, please keep in mind the maximum or "maximum case" operating conditions may not ever be reached on a continuous basis by a company during the normal course of its day-to-day operations. EPA assesses potential estimated risks based on reports of actual emissions of air toxics from facilities.

Q: EPA R6 has failed to make it clear in the materials provided that its EtO cancer risk estimates are entirely theoretical. Further, the air concentrations associated with the controversial cancer toxicity value that EPA relied upon in developing these cancer risk estimates is approximately 20,000 times lower than the air concentration associated with EtO levels that our bodies produce naturally. This suggests we are all at high risk of

developing cancer due to our body's natural production of EtO. Can EPA R6 help explain this?

A: EPA provided a verbal response during the meeting. We offer the following additional information to differentiate between the concentrations modeled during the risk assessment or NATA and the natural occurrence of EtO in humans:

Risk Assessment: You are correct that a human health risk assessment is the process to estimate the nature and probability of possible adverse health effects in humans who may be exposed to chemicals in contaminated environmental media in the future, in this case inhalation of ethylene oxide. It is not a report of actual cancer occurrences in the area being assessed..

NATA: EPA developed NATA as a screening tool for state, local and tribal air agencies. NATA's results help these agencies identify which pollutants, emission sources and places they may wish to study further to better understand any possible risks to public health from air toxics.

We suggest NATA results be used cautiously. The uncertainty – and thus the accuracy – of the results varies by place and by pollutant.

NATA's results:

- apply best to larger areas, not specific places;
- apply to groups, not to specific people;
- assume a person breathes the air toxics emitted in the analysis every day for 70 years;
- may give concentrations that are too high or too low for some air toxics and in some places;
- include risk estimates that are uncertain.

Ethylene Oxide in the Human Body: Our bodies produce ethylene oxide when metabolizing ethylene, which is produced naturally in the body. The percentage of ethylene converted to ethylene oxide in the body is unknown but expected to be low. Ethylene oxide (EtO) is eliminated from the body fairly quickly – with levels dropping by about 50% every 42 minutes. (The elimination half-life of EtO in humans is approximately 42 minutes; Filser et al., 1992). At that rate, almost 90% of ethylene oxide would be eliminated from the body in two hours.

Q: In the materials related to this community meeting, EPA R6 is emphasizing the Maximum Individual Risk of 300 in a million, when in reality, even EPA R6's theoretical worst-case risk assessment demonstrates that >99.8% of the population within 50 km of the Sasol Chemicals facility are within EPA's acceptable cancer risk range (1 to 100 in a million) and that the average risk is in fact 4 in a million. Does EPA plan to provide an uncertainty analysis that puts their theoretical cancer risk estimates into appropriate context?

A: Your statements regarding the population percentage predicted to have excess cancer risks at or lower than 100 in a million and the average cancer risk from the EPA risk assessment report are accurate. That being said, EPA does not plan to provide an uncertainty analysis for this specific risk assessment, and offers the following information:

The uncertainties in virtually all risk assessments can be divided into three areas:

- 1) uncertainties in the emission data sets,

- 2) exposure modeling uncertainties, and
- 3) uncertainties in the dose-response relationships.

Uncertainties in the emission estimates and in the air quality models lead to uncertainty in air concentrations. Uncertainty in exposure modeling can arise due to uncertain activity patterns, the locations of individuals within a census block, and the microenvironmental concentrations as reflected in the exposure model. Finally, uncertainty in the shape of the relationship between exposure and effects, the URE and the RfC, also contributes to uncertainties in the risk assessment.